

Appl. No. 10/698,116
Reply to Office Action of January 9, 2006

Attorney Docket No. P-11714.00 / 31849.86
Customer No. 46334

Amendments To The Drawings

An attached drawing sheet includes Figures 4a, 4b, 4c and 13, and replaces the original sheet that included Figures 4a, 4b and 4c.

In the replacement drawing sheet, Figure 13 has been added in order to show certain structure that was discussed in the specification and recited in the claims, but that was not clearly visible in the original drawings. In addition, Figure 4c has been modified to add broken lines, the label "Power Cord Assembly", reference numeral 18, and a lead line for reference numeral 18. These amendments are discussed in more detail in the remarks that follow.

Attachment: Replacement Sheet 3 of 10

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REMARKS

The title has been amended, the specification has been amended, the drawings have been amended, Claim 37 has been amended, and Claims 22-36 and 38-41 have been canceled. Claims 1, 3-21 and 37 are present in the application. In view of the foregoing amendments, and the remarks that follow, Applicant respectfully requests reconsideration.

Title of the Invention

The Office Action objected to the title of the invention, and suggested a replacement title. The foregoing amendments adopt the title suggested by the Examiner.

First Paragraph of 35 U.S.C. §112

The Office Action rejected Claim 37 under the first paragraph of §112, asserting that it contains subject matter that was not described in the originally-filed application papers. More specifically, the Office Action asserts that there is no written description for (1) only one end of a winding being electrically connected to a supply, or (2) which end of the winding is connected to the supply. This ground of rejection is respectfully traversed. MPEP §2163.02 discusses the "written description" requirement, and explains that:

... the fundamental factual inquiry is whether the specification conveys with reasonable clarity to those skilled in the art that, as of the filing date sought, applicant was in possession of the invention as now claimed.

As discussed earlier, Figure 2 of the present application shows a motor 12 that receives power from a power cord assembly 18, and Figure 4c shows part of the motor 12, including three coils 1, 2 and 3 that each have one end coupled to a common node 4. Persons skilled in the art are very familiar with motors having the three-coil configuration shown in Applicant's Figure 4c, and are also very familiar with how to couple a supply circuit to this coil configuration, in particular to the outer end of each coil. For example, Applicant is enclosing a copy of Figure 4

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of Geppert U.S. Patent No. 4,458,194, which issued in 1984 (more than 20 years before the filing date of the present application). In the lower right corner, Geppert's Figure 4 shows a motor 28 that has the same three-coil configuration as the motor 12 of the present application, and also shows how a control circuit 34 is coupled to only one end (the outer end) of each of the three coils.

As noted above, the issue in regard to the "written description" requirement is not whether the original application papers expressly describe every detail that is recited in the claims. Instead, the issue is whether the written description is sufficient so that a person skilled in the art will understand that Applicant was in possession of what is expressly recited in the claims. With this in mind, it is respectfully submitted that a person skilled in the art would readily understand from Applicant's disclosure how the power cord assembly 18 would be connected to each of the three coils 1-3 of the motor 12, and in particular would readily understand that the power cord assembly 18 is connected to only one end of each coil, which is the outer end. Accordingly it is respectfully submitted that there is no reasonable basis for the assertion in the Office Action that the present application fails to meet the written description requirement of the first paragraph of §112. (Moreover, as discussed in more detail below, Figure 4c of the present application is being modified to explicitly show that the power cord assembly 18 is connected to the three coils 1-3 of the motor 12, which was already implicit in the disclosure of the present application as originally filed). For these reasons, it is respectfully requested that the §112 rejection be withdrawn.

Drawing Amendment

The Office Action objected to the drawings under 37 C.F.R. §1.83(a), asserting that the drawings did not show every feature of the invention that is recited in the claims, and requiring appropriate correction.

A first part of this drawing objection related to the fact that, in the originally-filed application papers, Claims 10 and 25 each specified that a winding or coil has a conductive element of substantially rectangular shape, and paragraph [0037] also discussed this. The

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drawing amendments add new Figure 13, which shows this conductive element of rectangular shape.

A further part of the drawing objection related to claim limitations reciting that a winding is electrically connected to a power supply, and that the power supply is connected to one end of the winding. In the originally-filed application papers, Figure 1 showed a motor 12 and a power cord assembly 18, and paragraph [0031] explained that the power cord assembly provides electrical power to the motor 12. Figure 4c showed three coils 1, 2 and 3 that are part of the motor 12, and that each have one end connected to a common node 4. As discussed above, persons skilled in the art are very familiar with how a power cord assembly (such as that shown at 18) can be connected to a motor with a standard three-coil configuration (such as that shown in Figure 4c), for example as reflected by the enclosed drawing from the Geppert patent. With this in mind, the foregoing drawing amendments modify Figure 4c of the present application to add a diagrammatic representation of the power cord assembly 18 of Figure 1. In particular, the amendments add to Figure 4c a rectangular box in broken lines, three broken lines that each extend from the rectangular box to one end of a respective one of the three windings 1-3, a label "Power Cord Assembly" within the rectangular box, reference numeral 18, and a lead line extending from reference numeral 18 to the rectangular box.

The drawing amendments are all based directly on relevant portions of the originally-filed application papers, and in particular have been structured so as to avoid the introduction of any new matter into the disclosure of the invention. Approval of the amended drawings is respectfully requested. In light of the amended drawings, it is respectfully submitted that the drawings now clearly show every feature that is recited in the claims. Accordingly, it is respectfully submitted that the present application is in compliance with 37 C.F.R. §83(a), and notice to that effect is respectfully requested.

Amendments to the Specification

The Office Action objected to the specification, indicating that a reference to Figure 1 in paragraph [0038] should actually be a reference to Figure 2. The foregoing amendments modify this paragraph so that it now correctly refers to Figure 2 rather than Figure 1.

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In addition, paragraph [0037] has been amended to remove the amendments made by Applicant's last Response, thereby returning the language to the form it had when the present application was filed. In addition, at the end of this same sentence, a reference has been added to new Figure 13, because Figure 13 depicts certain structure that is described in this sentence.

New paragraph [0027.1] has been added in the Brief Description of the Drawings, so that the Brief Description of the Drawings now includes a reference to new Figure 13.

§102 Rejections Based on Multiple References

In sections 21 and 22 on pages 10-11 of the Office Action, the Examiner rejects Claims 13-17 and Claims 18-21 under 35 U.S.C. §102 as anticipated by a proposed combination of teachings from two or more references. Although multiple references can be used under §102 in certain rare circumstances (MPEP §2131.01), none of those rare circumstances are present here. Moreover, in the explanation of each of these rejections, the Examiner expressly discusses obviousness, in a manner that effectively admits these claims are not anticipated under §102. It is therefore assumed that the references to §102 are inadvertent errors, and were intended to be references to §103. Accordingly, for purposes of this Response, these rejections are treated as obviousness rejections under §103.

Claims 1, 3, 5-9, 12-15 and 37 -- 35 U.S.C. §103

In section 16 on page 8, the Office Action rejects each of Claims 1, 3, 5-9 and 12-15 under 35 U.S.C. §103 for obviousness, either (1) based on the Dunlop reference considered by itself, or (2) in the alternative based on Dunlop considered in combination with the Vaerenbergh article and Shirakawa U.S. Patent No. 5,140,210. Similarly, in section 23 on page 11, the Office Action rejects Claim 37 under 35 U.S.C. §103 for obviousness, either (1) based on the Dunlop reference considered by itself, or (2) in the alternative based on Dunlop considered in combination with the Vaerenbergh article and Futterer U.S. Patent No. 3,694,684. In each case, the §103 rejection that is based solely on Dunlop is respectfully traversed, for two reasons. First, the Office Action offers no explanation at all in support of the §103 rejections that are based solely on Dunlop, and thus the Office Action fails to meet the PTO's minimum requirements for

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a §103 obviousness rejection (for example as set forth in MPEP §706.02(j) and MPEP §2142). Second, in explaining the §103 rejections that are based on Dunlop in combination with other references, the Office Action expressly admits that Claims 1, 3, 5-9, 12-15 and 37 are not rendered obvious by Dunlop alone. Accordingly, the §103 rejections that are based solely on Dunlop have no merit, and it is respectfully submitted that they must be withdrawn. (The §103 rejections that are based on Dunlop in combination with other references are addressed below).

Independent Claim 1

In section 16 on page 8, the Office Action rejects independent Claim 1 under 35 U.S.C. §103 on the ground that it would be obvious in view of a proposed combination of teachings from Dunlop, Vaerenbergh and Shirakawa. This ground of rejection is respectfully traversed. MPEP §2142 specifies that:

The examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. If the examiner does not produce a *prima facie* case, the applicant is under no obligation to submit evidence of nonobviousness.

Applicant respectfully submits that the teachings drawn from Dunlop, Vaerenbergh and Shirakawa fail to establish a *prima facie* case of obviousness under §103 with respect to Claim 1, for reasons discussed below.

THERE IS NO REASONABLE EXPECTATION OF SUCCESS

Applicant's Claim 1 includes a recitation of:

... a protective layer disposed between the stator and the rotor; . . .

The §103 rejection of Claim 1 is explained in the first paragraph on page 8 of the Office Action. The Office Action admits that Dunlop does not disclose a protective layer between his stator and

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rotor. The Vaerenbergh reference has nothing to do with motors, and thus does not disclose this. The Office Action goes on to assert that, in view of Shirakawa, it would be obvious to modify Dunlop to add such a protective layer. This assertion is respectfully traversed.

In lines 17-24 on page 5, Dunlop emphasizes certain very specific preferred dimensions for all major components of his motor, including a relatively small size for the air gap 14 (Figure 1) that is provided between the stator and rotor. Dunlop states in lines 13-15 on page 5 that the size of the motor "can be scaled either up or down to provide motors of different size", but Dunlop appears to contemplate that the relative proportions of the stated dimensions are very important and should not be changed. For example, Dunlop states at lines 25-34 on page 5 that his precise structural configuration advantageously provides:

... a full load performance at 150 watts output, 13,300 revolutions per minute and having 96% efficiency. The full load loss is 6.25W comprising a no-load loss of 3.45W and a winding loss of 2.80W. The temperature rise of the case body is 15°C above 24°C ambient.

The back-EMF generated by the motor 10 is very nearly a sinusoid. For maximum motor efficiency, sinusoidal voltages should be applied to the motor 10.

In lines 23-25 on page 1, Dunlop emphasizes that small size and low rotational inertia are also important, stating that:

It is an object of the present invention to provide an electric motor and method of manufacture which permits high power output and high efficiency for comparatively small size and low rotational inertia.

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In view of the relatively small air gap 14 between Dunlop's stator and rotor, the addition of a protective layer between the stator and rotor would require changes to the radial distance between the rotor and the stator, thereby altering how they electromagnetically interact, and forcing changes in the relative proportions of the specific configuration disclosed by Dunlop. Moreover, the added protective layer would itself disrupt Dunlop's intended degree of electromagnetic interaction between the rotor and stator. It is not at all clear that this level of re-design of the Dunlop device would leave it with the capability to meet the performance standards emphasized by Dunlop. Moreover, the proposed modification would almost certainly result in an increase in the diameter of the Dunlop device, which runs contrary to Dunlop's stated goal of minimizing size. Further, the addition of Shirakawa's protective sleeve would necessarily increase the mass of Dunlop's rotor, and thus increase the rotational inertia of the rotor, which runs contrary to Dunlop's stated goal of minimizing rotational inertia.

MPEP §2142 specifies that, in order to properly establish a prima facie case of obviousness under §103, it is a requirement that the Examiner must show "there must be a reasonable expectation of success. . . . and the reasonable expectation of success must . . . be found in the prior art, and not based on applicant's disclosure". Here, the Office Action fails to even discuss the issue of whether there would be a reasonable expectation of success, much less explain in detail where specific portions of Dunlop or Shirakawa teach that there would be a reasonable expectation of success. Apparently, the Examiner is relying on the teachings of Applicant's disclosure (rather than Dunlop and Shirakawa) for the belief that there would be a reasonable expectation of success. However, as evident from the quoted language in MPEP §2142, the MPEP expressly prohibits the Examiner from relying on Applicant's disclosure in regard to expectation of success.

Therefore, since the Office Action fails to even discuss the criteria of a reasonable expectation of success, much less explain why Dunlop and/or Shirakawa would provide such an expectation, it is respectfully submitted that the Office Action fails to establish a prima facie case of obviousness under §103 with respect to Claim 1. Accordingly, for this independent reason alone, it is respectfully submitted that Claim 1 is allowable over Dunlop and Shirakawa (considered with or without Vaerenbergh), and notice to that effect is respectfully requested.

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PROPOSED MODIFICATION CANNOT DEFEAT INTENDED PURPOSE OF PRIOR ART

With respect to the analysis of obviousness under §103, MPEP §2143.01 specifies that, where an examiner proposes a modification to a reference:

**THE PROPOSED MODIFICATION CANNOT RENDER THE
PRIOR ART UNSATISFACTORY FOR ITS INTENDED
PURPOSE**

If [a] proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification.

As discussed above, Dunlop explains that his invention intentionally and simultaneously achieves several purposes, including high power output, high efficiency, small size, low rotational inertia, a sinusoidal back-emf, an acceptable temperature rise, and acceptable full load performance and full load loss. But as also discussed above, the proposed modification to Dunlop works against at least some of these purposes, such that the modified motor would be rendered less than satisfactory for at least some of its intended purposes. Consequently, as discussed in MPEP §2143.01, the proposed modification to Dunlop would not be obvious under §103. For this reason alone, it is respectfully submitted that the subject matter of Applicant's Claim 1 would not be obvious under §103 in view of Dunlop, and notice to that effect is respectfully requested.

THE PROPOSED MODIFICATION OF DUNLOP IS NOT PROPER

There is yet another reason why the proposed modification of Dunlop is not proper under §103. In this regard, MPEP §2142 provides that:

To reach a proper determination under §103, the examiner must step backward in time and into the shoes worn by the hypothetical

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"person of ordinary skill in the art" when the invention was unknown and just before it was made. . . . Knowledge of applicant's disclosure must be put aside in reaching this determination, . . . impermissible hindsight must be avoided, and the legal conclusion must be reached on the basis of the facts gleaned from the prior art.

In addition, the MPEP provides at § 2143.01 that:

The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. . . . Although a prior art device "may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so". (Emphasis in original).

In regard to motivation for making the proposed modification of Dunlop's rotor (to add the protective sleeve of Shirakawa), the Office Action asserts that a person skilled in the art would be motivated to make this modification "to allow safe high-speed rotation". However, Dunlop already teaches that his rotor can spin at the very high speed of 13,300 rpm, and presumably it does so safely. Therefore, since Dunlop's rotor is already capable of safe high-speed rotation, it is respectfully submitted that a person skilled in the art would not have any motivation to modify Dunlop in order to fix a safety problem that is not actually present in Dunlop. Moreover, to the extent Dunlop emphasizes that he wants to achieve low rotational inertia, a compact size, and certain performance characteristics, and to the extent that adding Shirakawa's protective sleeve tends to undermine all of these goals, it is respectfully submitted that Dunlop itself would tend to motivate the skilled person not to make the proposed modification.

Thus, neither Dunlop nor Shirakawa would actually motivate a skilled person to make the proposed modification and, if anything, the person would be motivated not to make the proposed

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modification. Consequently, as a practical matter, the §103 rejection is actually based on hindsight of the present invention, rather than on motivation properly derived from what was known prior to the present invention. But this is not proper, because the MPEP prohibits the use of hindsight. In particular, with reference to MPEP §2142, the PTO requires that the "teaching or suggestion to make the claimed combination . . . must . . . be found in the prior art, and not based on applicant's disclosure". Thus, the present §103 rejection of Claim 1 is not complete, because it fails to properly demonstrate the motivation that is required by the MPEP. Accordingly, for this independent reason alone, it is respectfully submitted that Claim 1 is not rendered obvious under §103, and notice to that effect is respectfully requested.

In view of the various different reasons discussed above, it is respectfully submitted that Claim 1 is not rendered obvious under §103 by Dunlop, Vaerenbergh and Shirakawa. Claim 1 is therefore believed to be allowable, and notice to that effect is respectfully requested.

Dependent Claims

Claims 3-21 and 37 each depend directly or indirectly from Claim 1, and are also believed to be distinct from the art of record, for example for the same reasons discussed above with respect to Claim 1.

Conclusion

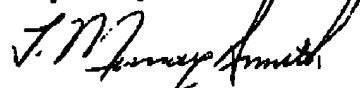
Based on the foregoing, it is respectfully submitted that all of the pending claims are fully allowable, and favorable reconsideration of this application is therefore respectfully requested. If the Examiner believes that examination of the present application may be advanced in any way by a telephone conference, the Examiner is invited to telephone the undersigned attorney at 972-739-8647.

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Although Applicant believes that no fee is due in association with the filing of this Amendment, the Commissioner is hereby authorized to charge any fee required by this paper, or to credit any overpayment, to Deposit Account No. 08-1394 of Haynes and Boone LLP.

Respectfully submitted,



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Enclosures: Copy of Drawing Sheet 3 from U.S. Patent No. 4,458,194
Replacement Drawing Sheet 3

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